

Amit Jain's Offloading Ladder in Diabetic Foot

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Abstract: Diabetic foot ulcers are common in clinical practice and they are often difficult to treat, especially the plantar ulcers which are common in patients with neuropathy. One modality of treatment that is important is offloading of the foot. There are distinct offloading methods used in clinical practice in different parts of the world. In this article, author suggest a practical offloading ladder approach for diabetic foot ulcers.

Keywords: Diabetic Foot, Ulcers, Offloading, Ladder, Classification.

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INTRODUCTION

Of the numerous strategies used in treatment of diabetic foot ulcer, offloading is one of the important strategies used in management of ulcers in diabetic foot [1]. The offloading can be external offloading (mechanical/non-surgical) or surgical offloading [2, 3]. The known methods of offloading (non-surgical) are bed rest, wheel chairs, therapeutic footwear, total contact cast (TCC), Amit Jain's offloading system, felted foam, etc [3, 4]. Some of the commonly used surgical (internal) offloading include Tendo-Achilles lengthening, arthroplasties, metatarsal head resection, osteotomies, etc [3-6].

The external/non-surgical offloading's is recommended to be used primarily in diabetic foot ulcers with non-removal devices like total contact cast to be the first choice of offloading according to the IWGDF 2023 guidelines and the surgical offloading's being recommended only when non-surgical offloading fails to heal plantar ulcers [6].

The author had provided an easy, practical descriptive focal classification of external/non-surgical offloading [7]. According to this classification (Table 1), the offloading was divided into 3 types namely type 1 (Simple), type 2 (Complex), and type 3 (Complicated) offloading [8].

Table 1: showing Amit Jains' Classification of Offloading (external/non-surgical)

Types of offloading	Description	Examples
Type 1 offloading	Simple	Felted foam, Amit Jain's offloading system, wedge footwear, etc
Type 2 offloading	Complex	Removable cast walker, Charcot restraint orthotic walker (CROW), etc
Type 3 offloading	Complicated	Total contact cast and its variants, Bohler Iron cast, etc

The author had developed distinct amputation ladder and its variants in lines like reconstructive ladder and its variants [9, 10], and applied this ladder and elevator approach to therapeutic footwear also [11]. The author had not applied earlier the ladder approach to offloading as there were only 3 categories of offloading [10].

Later, the author had developed a new classification (revised) of surgical offloading (Table 2) consisting of 3 types of surgical offloading namely type 1 surgical offloading (Simple), type 2 surgical offloading (Complex) and type 3 surgical offloading (Complicated) for diabetic foot ulcers [3].

Table 2: Showing Amit Jain’s classification of surgical offloading (revised)

Type of Surgical Offloading	Description	Examples
Type 1 Surgical Offloading	Simple	Tenotomies, T.A.L, Gastrocnemius recession, etc
Type 2 Surgical Offloading	Complex	Osteotomies, arthroplasties, tendon transfers, etc
Type 3 Surgical Offloading	Complicated	Arthrodesis, Joint Stabilization procedures, etc

In lines like Amit Jain’s amputation ladder/elevator approach and footwear ladder/elevator

approach, the author proposes a new offloading ladder/elevator approach in diabetic foot (Figure 1).

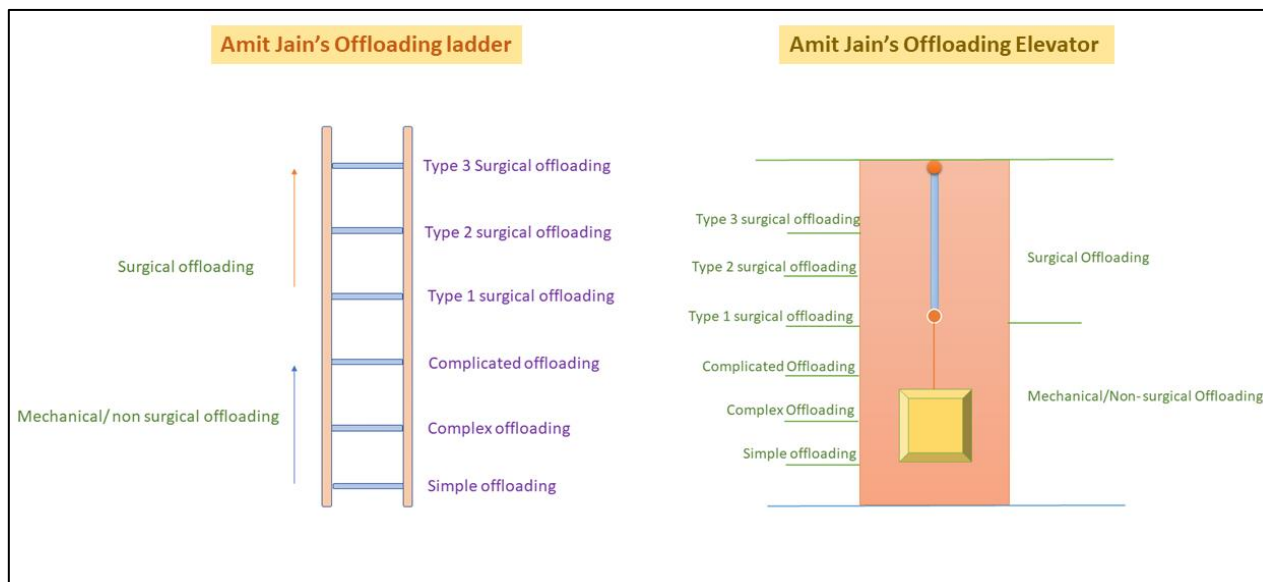


Fig. 1: Amit Jain’s offloading ladder/elevator approach for Diabetic foot

This offloading ladder/staircase approach can be used as an excellent model for teaching as well as clinical practice as it provides a practical guide to decide the usage of offloading. The author, based on practicality of offloading and issues like compliance, availability, affordability, applicability, acceptability, etc, had recommended simple offloading devices (level 1) as the first choice in clinical practice. One can climb the rung of the ladder gradually if the ulcer does not heal with one type of offloading. He can also use an elevator approach wherein the clinician can go directly to the choice of offloading based on the case scenario presented to him. For example, a surgeon encounters a new case of a hallux ulcer that has not healed with aptly used external offloading for appropriate duration or has recurred frequently and there is internal cause [12], of non-healing (Amit Jain’s class 2 diabetic foot ulcer) like hallux rigidus/limitus, then he can use the elevator approach wherein he can use the complex surgical offloading (Resection arthroplasty).

CONCLUSION

Usage of offloading in healing of diabetic foot ulcers poses challenge to the treating diabetic foot surgeons as there are many practical problems in selecting an offloading and it is governed by many factors that include socioeconomic status, compliance, biomechanical status of foot, availability, etc. The offloading ladder is a practical, simple, easy to remember approach guiding the treating clinician on usage of

offloading in healing diabetic foot wounds and it can be used as a good teaching tool.

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